

**TABLE 12-44
COMPARISON OF ANALYTE CONCENTRATIONS AT TOXICITY TEST LOCATIONS WITH SEDIMENT BENCHMARKS
TIDAL FLATS**

**REMEDIAL INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT**

LEPTOCHEIRUS TOXICITY RESULTS		Concentration (mg/kg)									
		SDTA006A 5/13/1999	SDTA007A 5/13/1999	SDTB006A 5/14/1999	SDTB007A 5/14/1999	SDTC006A 5/14/1999	SDTC007A 5/14/1999	SDTD006A 5/14/1999	SDTD007A 5/14/1999	SDTG002A 5/17/1999	SDTH001A 5/17/1999
	SAMPLE ID										
	SAMPLE DATE										
	% SURVIVAL	64 ^a	29 ^a	36 ^a	11 ^a	0 ^b	12 ^a	5 ^a	14 ^a	6 ^a	8 ^a
	GROWTH*	0.23 ^b	0.17 ^b	0.16 ^b	0.05 ^b	--	0.09 ^b	0.13 ^b	0.31 ^b	0.09 ^b	0.17 ^b
	MEAN FECUNDITY	38 ^b	c	50 ^b	c	c	100 ^b	c	50 ^b	c	c
	MEAN OFFSPRING PRODUCTION**	d	d	d	d	d	d	d	d	d	d
Compound	ERM (mg/kg)										
Aluminum		11400 J	14300 J	9260 J	9090 J	9970 J	10100 J	10200 J	9300 J	9070	7470 J
Antimony		2.2 N	2.4 N	1.5 N	2.1 N	2.6 N	2 N	1.9 N	2 N	1.7 N	5.2 N
Arsenic	70	6.3	6.9	4.6	5.1	5.3	5.5	5	4.7	4.8	5.6
Barium		49.2	54	40.3	34.8 B	52.9	42.5	42.1	40.8	37.5 B	35.7 B
Beryllium		0.52 B	0.68 B	0.42 B	0.43 B	0.47 B	0.49 B	0.45 B	0.44 B	0.46 B	0.42 B
Cadmium	9.6	2.4	2.2	1.7	1.7	3.9	2.1	2.2	1.8	2.1	4.1
Chromium	370	191	196	129	156	267	184	177	153	157 N	796 NJ
Cobalt		11	12 B	9.3	8.6 B	11.8	10	10.5	9.3 B	9.9 B	10.7 B
Copper	270	408	586	283	482	342	431	301	300	345	431 J
Hydrogen Cyanide		NA									
Iron		23900 J	29100 J	18400 J	19800 J	20400 J	21500 J	20900 J	19000 J	18200	16300 J
Lead	218	71.2	94.2	54	66.5	58.8	72.5	54.9	53.4	57.3	60.7
Manganese		274	334	228	260	261	258	255	265	257	325
Mercury	0.71	0.66 BN	0.74 BN	0.45 BN	0.58 BN	0.45 BN	0.46 BN	0.34 BN	3.7 N	0.45 B	0.44 B
Methyl mercury		0.00173	0.00285	0.00161	0.00189	0.00131	0.00121	0.00051	0.00108	0.00167	0.00122
Nickel	51.6	49.5	37.4	30	28.3	87.5	37.3	71.1	37.7	54.3 N	154 N
Selenium		0.9 J	1.7 J	1	0.87 B	1.2	1.1	1.1	0.96	1.5 N	1.4 N
Silver	3.7	3.7	1.6 B	7.3	1.6 B	3	3.2	2.3	1.8 B	2.9	4.1
Vanadium		30.7	36.7	25.6	24.4	28.2	28.6	27.5	25.8	26.4	25.8
Zinc	410	258	312	208	241	247	273	241	211	255 N	247 N

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STRATFORD, CONNECTICUT

LEPTOCHEIRUS TOXICITY RESULTS		Concentration (mg/kg)									
SAMPLE ID		SDTA006A	SDTA007A	SDTB006A	SDTB007A	SDTC006A	SDTC007A	SDTD006A	SDTD007A	SDTG002A	SDTH001A
SAMPLE DATE		5/13/1999	5/13/1999	5/14/1999	5/14/1999	5/14/1999	5/14/1999	5/14/1999	5/14/1999	5/17/1999	5/17/1999
% SURVIVAL		64 ^a	29 ^a	36 ^a	11 ^a	0 ^b	12 ^a	5 ^a	14 ^a	6 ^a	8 ^a
GROWTH*		0.23 ^b	0.17 ^b	0.16 ^b	0.05 ^b	--	0.09 ^b	0.13 ^b	0.31 ^b	0.09 ^b	0.17 ^b
MEAN FECUNDITY		38 ^b	c	50 ^b	c	c	100 ^b	c	50 ^b	c	c
MEAN OFFSPRING PRODUCTION**		d	d	d	d	d	d	d	d	d	d
Compound	ERM (mg/kg)										
Acetone		0.007 UJ	0.008 UJ	0.006 UJ	0.007 J	0.006 UJ	0.006 UJ	0.006 UJ	0.006 UJ	0.007 UJ	0.007 U
2-Methylnaphthalene	0.67	0.39 P	0.29	0.44 P	0.13 P	0.28 P	0.26 P	0.3 PJ	0.16	0.41 P	0.58 P
Acenaphthene	0.5	1.1	0.87 P	1.1	0.33 P	0.72 P	0.66 P	0.82 PJ	0.39 P	1.1	2
Acenaphthylene	0.64	0.092 U	0.11 U	0.15 U	0.044 U	0.042 U	0.054 U	0.042 UJ	0.04 U	0.045 U	0.063 U
Anthracene	1.1	0.12 P	0.11	0.12	0.038	0.063	0.066	0.069 J	0.033	0.1	0.19
Benzo[a]anthracene	1.6	0.33	0.24	0.38 D	0.12	0.17	0.2	0.17 J	0.13	0.3	0.54 D
Benzo[a]pyrene	1.6	0.54	0.48	0.45 D	0.21	0.32	0.4 D	0.31 J	0.22	0.51 D	0.73 PD
Benzo[b]fluoranthene		0.51	0.46	0.47	0.19	0.34	0.37	0.3 J	0.22	0.53	0.73
Benzo[ghi]perylene		0.37 P	0.41	0.29	0.15	0.25	0.3 P	0.23 PJ	0.16 P	0.39 P	0.56
Benzo[k]fluoranthene		0.27 P	0.25 P	0.24	0.1 P	0.18 P	0.19 P	0.16 PJ	0.12 P	0.27 P	0.36 P
Chrysene	2.8	0.48	0.38	0.34 PD	0.18	0.25	0.22 P	0.22 J	0.17	0.3 P	0.61 D
Dibenz[a,h]anthracene	0.26	0.033 P	0.043 P	0.044	0.028 P	0.04 P	0.045 P	0.042 PJ	0.03 P	0.068 P	0.083 P
Dibenzofuran		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	5.1	1	0.73	0.97 D	0.3	0.61	0.55	0.57 J	0.37	0.87 D	1.4 D
Fluorene	0.54	0.044 P	0.026 P	0.024 P	0.0092 P	0.024 P	0.019 P	0.021 PJ	0.012 P	0.025 P	0.052 P
Indeno[1,2,3-cd]pyrene		0.36	0.37	0.25	0.13	0.21 P	0.26	0.2 J	0.14	0.3 P	0.36
Naphthalene	2.1	0.1	0.071	0.093	0.063	0.1	0.085	0.12 J	0.057	0.12	0.13
N-Nitrosodiphenylamine		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	1.5	0.55	0.31	0.44 D	0.14	0.31	0.26	0.3 J	0.16	0.37 D	0.8 D
Pyrene	2.6	1.1 D	0.84 D	0.89 D	0.36	0.58 D	0.67 D	0.56 DJ	0.38 D	0.88 D	1.4 D
Total PAHs	44.792	7.36	5.95	6.63	2.51	4.48	4.59	4.43	2.78	6.58	10.6
Aroclor-1248		0.019 U	0.023 U	0.016 U	0.019 U	0.57	0.12	0.48	0.1 J	0.24	0.09
Aroclor-1254		0.0068 U	0.0081 U	0.0058 U	0.0066 U	0.61	0.17	0.51 P	0.13 J	0.26	0.17
Aroclor-1260		0.076 P	0.052 P	0.079 P	0.099	0.22 P	0.099 P	0.2 P	0.062 J	0.21 P	0.25
Total PCBs	0.18	0.125	0.11	0.12	0.146	1.43	0.421	1.22	0.324	0.746	0.545
Total Organic Carbon (TOC)		57500	141000	85500	42900	29700	20200	20800	39600	51200	47800
Percent Fine Grain (<0.074 mm)		83	95	75	84	82	75	76	68	83	80

Notes:

- All concentrations in mg/kg
- * - Growth is mean dry weight (mg/surviving organism; std.
- ** - Mean Fecundity is % females with eggs
- a - Significantly different from the control based on percent survival.
- b - Samples that had no surviving organisms or significantly less survival than the control are not included in statistical analyses.
- c - Sample had no surviving mature females.
- d - Sample was not analyzed for offspring production because sample was already significantly different from the control based on survival.
- B - report value less than Contract Required Detection Limit but greater than or equal to the Instrument Detection Limit
- D - Dilution
- J - estimated value
- N - Tentatively Identified Compound
- P - a greater than 20% difference was detected between GC columns
- U - Not detected at detection limit
- W - post-digestion spike (analytical spike) is out of control limits (85%-115%), while sample absorbance is less than 50% of "spike " absorbance
- NA - not applicable / not available

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TIDAL FLATS

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STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

LEPTOCHEIRUS TOXICITY RESULTS		Hazard Quotient (HQ)									
SAMPLE ID		SDTA006A	SDTA007A	SDTB006A	SDTB007A	SDTC006A	SDTC007A	SDTD006A	SDTD007A	SDTG002A	SDTH001A
SAMPLE DATE		5/13/1999	5/13/1999	5/14/1999	5/14/1999	5/14/1999	5/14/1999	5/14/1999	5/14/1999	5/17/1999	5/17/1999
% SURVIVAL		64 ^a	29 ^a	36 ^a	11 ^a	0 ^b	12 ^a	5 ^a	14 ^a	6 ^a	8 ^a
GROWTH*		0.23 ^b	0.17 ^b	0.16 ^b	0.05 ^b	--	0.09 ^b	0.13 ^b	0.31 ^b	0.09 ^b	0.17 ^b
MEAN FECUNDITY		38 ^b	c	50 ^b	c	c	100 ^b	c	50 ^b	c	c
MEAN OFFSPRING PRODUCTION**		d	d	d	d	d	d	d	d	d	d
Compound	ERM (mg/kg)										
Aluminum											
Antimony											
Arsenic	70	0.090	0.099	0.066	0.073	0.076	0.079	0.071	0.067	0.069	0.080
Barium											
Beryllium											
Cadmium	9.6	0.25	0.23	0.18	0.18	0.41	0.22	0.23	0.19	0.22	0.43
Chromium	370	0.52	0.53	0.35	0.42	0.72	0.50	0.48	0.41	0.42	2.15
Cobalt											
Copper	270	1.5	2.2	1.0	1.8	1.3	1.6	1.1	1.1	1.3	1.6
Hydrogen Cyanide											
Iron											
Lead	218	0.33	0.43	0.25	0.31	0.27	0.33	0.25	0.24	0.26	0.28
Manganese											
Mercury	0.71	0.93	1.04	0.63	0.82	0.63	0.65	0.48	5.2	0.63	0.62
Methyl mercury											
Nickel	51.6	1.0	0.7	0.6	0.5	1.7	0.7	1.4	0.7	1.1	3.0
Selenium											
Silver	3.7	1.0	0.4	2.0	0.4	0.8	0.9	0.6	0.5	0.8	1.1
Vanadium											
Zinc	410	0.6	0.8	0.5	0.6	0.6	0.7	0.6	0.5	0.6	0.6

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SAMPLE DATE		5/13/1999	5/13/1999	5/14/1999	5/14/1999	5/14/1999	5/14/1999	5/14/1999	5/14/1999	5/17/1999	5/17/1999
% SURVIVAL		64 ^a	29 ^a	36 ^a	11 ^a	0 ^b	12 ^a	5 ^a	14 ^a	6 ^a	8 ^a
GROWTH*		0.23 ^b	0.17 ^b	0.16 ^b	0.05 ^b	--	0.09 ^b	0.13 ^b	0.31 ^b	0.09 ^b	0.17 ^b
MEAN FECUNDITY		38 ^b	c	50 ^b	c	c	100 ^b	c	50 ^b	c	c
MEAN OFFSPRING PRODUCTION**		d	d	d	d	d	d	d	d	d	d
Compound	ERM (mg/kg)										
Acetone		0.6	0.4	0.7	0.2	0.4	0.4	0.4	0.2	0.6	0.9
2-Methylnaphthalene	0.67	2.2	1.7	2.2	0.7	1.4	1.3	1.6	0.8	2.2	4.0
Acenaphthene	0.5	0.14	0.17	0.23	0.07	0.07	0.08	0.07	0.06	0.07	0.10
Acenaphthylene	0.64	0.11	0.10	0.11	0.03	0.06	0.06	0.06	0.03	0.09	0.17
Anthracene	1.1	0.21	0.15	0.24	0.08	0.11	0.13	0.11	0.08	0.19	0.34
Benzo[a]anthracene	1.6	0.34	0.30	0.28	0.13	0.20	0.25	0.19	0.14	0.32	0.46
Benzo[a]pyrene	1.6										
Benzo[b]fluoranthene											
Benzo[ghi]perylene											
Benzo[k]fluoranthene											
Chrysene	2.8	0.17	0.14	0.12	0.06	0.09	0.08	0.08	0.06	0.11	0.22
Dibenz[a,h]anthracene	0.26	0.13	0.17	0.17	0.11	0.15	0.17	0.16	0.12	0.26	0.32
Dibenzofuran											
Fluoranthene	5.1	0.20	0.14	0.19	0.06	0.12	0.11	0.11	0.07	0.17	0.27
Fluorene	0.54	0.08	0.05	0.04	0.02	0.04	0.04	0.04	0.02	0.05	0.10
Indeno[1,2,3-cd]pyrene											
Naphthalene	2.1	0.048	0.034	0.044	0.030	0.048	0.040	0.057	0.027	0.057	0.062
N-Nitrosodiphenylamine											
Phenanthrene	1.5	0.37	0.21	0.29	0.09	0.21	0.17	0.20	0.11	0.25	0.53
Pyrene	2.6	0.42	0.32	0.34	0.14	0.22	0.26	0.22	0.15	0.34	0.54
Total PAHs	44.792	0.16	0.13	0.15	0.06	0.10	0.10	0.10	0.06	0.15	0.24
Aroclor-1248											
Aroclor-1254											
Aroclor-1260											
Total PCBs	0.18	0.69	0.61	0.67	0.81	7.9	2.3	6.8	1.8	4.1	3.0
Total Organic Carbon (TOC)											
Percent Fine Grain (<0.074 mm)											

Notes:

All concentrations in mg/kg

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** - Mean Fecundity is % females with eggs

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